AMENDMENTS TO THE CLAIMS:

1-40. (Canceled)

41. (Currently Amended) A method for making a long superconductor, e.g. a tape or wire, by depositing at least one polycrystalline superconducting compound onto a metallic substrate or onto a buffer layer system on said substrate, characterized by the following steps

- fabricating said metallic substrate or said buffer layer system to consist of or to contain at least on its surface a microstructure of longitudinally oriented, long grains with a high aspect ratio, $a = L_{par}/L_{per}$ exceeding 1.5, said microstructure being controlled by mechanical, atom-beam, or ion-beam treatment,
- producing on said surface of said metallic substrate or on top of said buffer layer grooves in a direction of current flow, and
- epitaxially growing said superconducting compound on said substrate or on a top layer of said buffer layer system to produce a percolation path of long superconducting grains being aligned longitudinally and exhibiting a high aspect ratio such that their projection, being characterized by a length L_{par} parallel to the longitudinal extension of said superconductor and a length L_{per} perpendicular thereto, has an aspect ratio $a = L_{par}/L_{per}$ exceeding 1.5, the total volume V of said long superconducting grains exceeding 10% of the volume of said superconducting compound.

42. (Original) The method according to claim 41, wherein the buffer layer system is provided on a substrate of arbitrary structure, the top layer of said buffer layer system containing or consisting of a microstructure of longitudinally aligned grains with the high aspect ratio, $a = L_{par}/L_{per}$ exceeding 1.5, and wherein the superconducting compound is grown on said top layer of said buffer layer system.

43. (Canceled)

44. (Canceled)

45. (Currently Amended) The method according to claim 41 ~~[44]~~, wherein ~~the microstructure of the surface of the substrate or of the top buffer layer is treated to produce grooves in said surface, said~~ the grooves ~~having~~ have a depth of about 100nm, a length of about 100μm and a density of about 1/μm.

46. (Original) The method according to claim 41, wherein the microstructure control steps are executed and/or repeated until an average angular misorientation of the produced long grains of the superconducting compound of less than 15° is achieved.

47. (Original) The method according to claim 41, wherein the superconducting compound is deposited from the vapor phase.

48. (Original) The method according to claim 41, wherein the deposition of the superconducting compound or is performed from a solution.

49. (Canceled)

50. (Original) An at least partly superconducting object, in particular a wire or cable, comprising a superconductor fabricated according to claim 41.

51. (Original) The method according to claim 42, wherein the buffer layer system consists of a single layer only.

52. (Original) The method according to claim 41, wherein the aspect ratio $a > 4$.

53. (Original) The method according to claim 41, wherein the total volume $V > 25\%$.

54. (Original) The method according to claim 41, wherein the superconducting compound is a polycrystalline multilayer arrangement whose layers have different compositions.

55. (Original) The method according to claim 54, wherein at least one layer of the superconducting compound is or contains a cuprate.

56. (Original) The method according to claim 54, wherein at least one superconducting compound of the layers belongs to the $ReBa_2Cu_3O_{7-\delta}$ family, Re being a rare earth including La or Y.

57. (Original) The method according to claim 41, wherein the grains of the substrate and/or the grains of the superconductor are aligned such that the average misorientation angle is below 20°.

58. (Original) The method according to claim 41, wherein the substrate is a metallic tape such as steel or a Ni alloy with a thickness in the range of 20 to 100 μm, whose surface grains are appropriately aligned.

59. (Original) The method according to claim 42, wherein the buffer layer system comprises a plurality of sublayers such as CeO_2/YsZ/CeO_2.

60. (New) A method for making a long superconductor, e.g. a tape or wire, by depositing at least one polycrystalline superconducting compound onto a metallic substrate or onto a buffer layer system on said substrate, characterized by the following steps:

- fabricating said metallic substrate or said buffer layer system to consist of or to contain at least on its surface a microstructure of longitudinally oriented, long grains with a high aspect ratio, $a = L_{par}/L_{per}$ exceeding 1.5, said microstructure being controlled by mechanical, atom-beam, or ion-beam treatment,
- said surface of said substrate or of the top buffer layer is treated to produce grooves, said grooves having a depth of about 100nm, a length of about 100μm and a density of about 1/μm, and
- epitaxially growing said superconducting compound on said substrate or on a top

layer of said buffer layer system to produce a percolation path of long superconducting grains being aligned longitudinally and exhibiting a high aspect ratio such that their projection, being characterized by a length L_{par} parallel to the longitudinal extension of said superconductor and a length L_{per} perpendicular thereto, has an aspect ratio $a = L_{par} / L_{per}$ exceeding 1.5, the total volume V of said long superconducting grains exceeding 10% of the volume of said superconducting compound.